

CLAIMS

1. An electronic device comprising:
 - a semiconductor device provided with a plurality of bond pads, of which bond pads a first portion is defined for ground connection and a second portion is defined for voltage supply and a third portion is defined for signal transmission, and
 - 5 - a carrier substrate comprising a layer of dielectric material and having a first side and an opposed second side, which are each provided with an electrically conductive layer, on which first side bond pads are present corresponding to the bond pads of the semiconductor device, and on which second side contact pads for external coupling are provided, the contact pads and the bond pads being electrically interconnected according to a
 - 10 desired pattern, the contact pads being subdivided into a first, a second and a third portion corresponding to the portions of the semiconductor device, the first and second portions of the bond pads being present laterally in an inner area and the third portion being present in an outer area laterally around the inner area, wherein
 - 15 - the semiconductor device is coupled to the carrier substrate in a flip-chip orientation, and
 - the bond pads and the contact pads for voltage supply and ground connection are located correspondingly, so as to provide a direct path from the contact pads at the substrate to the corresponding bond pads of the semiconductor device, and
 - 20 - the pads of the first and second portions are arranged such that at least one direct path dedicated to voltage supply connection acts as a coaxial center conductor.
2. An electronic device as claimed in claim 1, wherein the bond pads of the first and second portion form a joint array, having an edge and an inner area, and the bond pads of
- 25 the second portion at the edge are provided with ESD protection structures, the bond pads of the second portion in the inner area being free of such ESD protection structures.
3. An electronic device as claimed in claim 2, wherein the pads for ground and supply connection are arranged according to a chessboard pattern.

4. An electronic device as claimed in claim 1, wherein a layer of dielectric material extends from the first to the second side in the substrate.
- 5 5. An electronic device as claimed in claim 1, characterized in that the bond pads of the third portion and the corresponding contact pads for external coupling are interconnected through:
- interconnects defined in the conductive layer on the first side of the carrier substrate, and
 - 10 - vertical interconnects through the carrier substrate which, in the case of perpendicular projection on the conductive layer on the second side, have a substantial overlap with the contact pads for signal transmission.
6. An electronic device as claimed in claim 5, characterized in that
- 15 - a ground plane is defined in the conductive layer on the second side of the carrier substrate,
 - the mutual distance between the interconnects and the dielectric thickness of the carrier substrate are chosen such that the interconnects have transmission line characteristics.
- 20
7. An electronic device as claimed in claim 1 or 6, further comprising a mechanical stiffener layer on the first side of the carrier substrate.
8. An electronic device as claimed in claim 1, further comprising a spacer layer
- 25 on the first side of the carrier substrate, which spacer layer is covered by a heat dissipation layer, which heat dissipation layer is in thermal contact with the semiconductor device at a face thereof opposite to the face comprising the bond pads.
9. An electronic device as claimed in claim 8, wherein the heat dissipation layer
- 30 is connected thermally to a heat sink at the carrier substrate.
10. An electronic device as claimed in claim 1, further comprising a second semiconductor device that is provided with a direct path for ground and voltage supply

connection from its bond pads to the second side of the carrier substrate, on which second side contact pads for ground and voltage supply connection are present.

11. A carrier substrate comprising a layer of dielectric material and having a first side and an opposed second side, which are each provided with an electrically conductive layer, on which first side bond pads for coupling to bond pads of a semiconductor device are present, and on which second side contact pads for external coupling are provided, the contact pads and the bond pads being electrically interconnected according to a desired pattern, the contacts pad being subdivided into a first portion for voltage supply connection, a second portion for ground connection and a third portion for signal transmission, the first and second portions of the bond pads being present laterally in an inner area and the third portion being present in an outer area laterally around the inner area, wherein
- the first and second portions of the bond pads jointly make up an array, which array extends to the contact pads on the second side of the carrier substrate, so as to form a direct path, and
 - the pads for ground connection and for supply connection are arranged in the array such that each of the pads for supply connection has pads for ground connections as its closest neighbour pads.